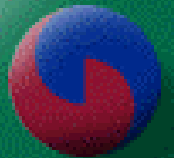


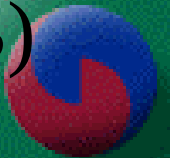
Identification of milk samples and linking to the recorded cow

- A challenge to NMR with more and more samples destined for additional disease or pregnancy diagnosis after the traditional milk recording tests.



Background Information NMR

- 5,500 recording customers (47% GB herds)
- Average herd size 157 cows
- Samples collected from farm by tanker.
- NMR transport, 20 vans, 100 collection points daily
- 2 laboratories (Glasgow & Wolverhampton)
- Testing 9.00pm overnight
- 60 milk buyers (100% payment testing GB)







NMR Groups locations

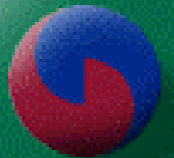






IT systems

- THOR – on farm data collection/ processing and web link to NMR database.
- Sample Manager- lab based link to THOR to allow sample racking out checks.
- Lab system- runs the NMR sample testing and data collection.
- HAMSTA- Disease testing management and reporting.
- No pot of money to scrap all systems and start again with bar codes/ RFID tags.



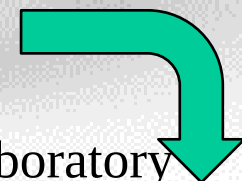
Start



Samples



Laboratory
Sample
Manager



THOR Data

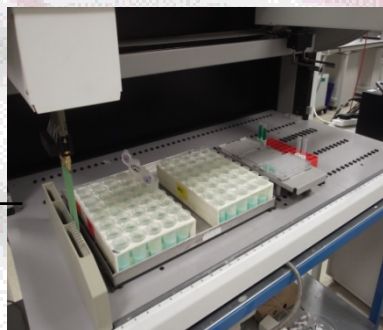


NMR Lab
system.
Retain
samples after
combi testing

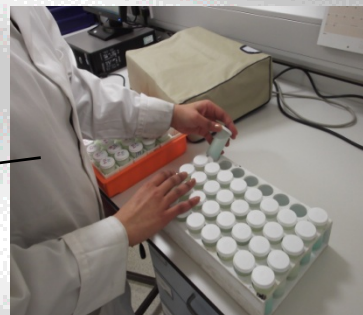
Report results



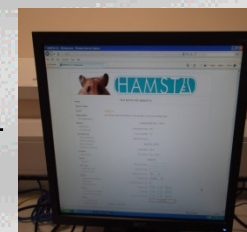
ELIZA test



Sample using
Tecan



Rack out
samples

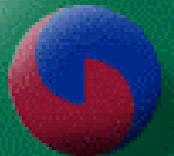


Manually
Register
into
HAMSTA



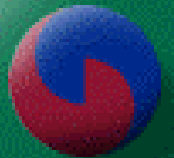
Concerns

- More and more samples are destined for additional testing after the traditional Fat, Protein and Somatic Cell Count tests have been completed.
- NMR systems rely on accurate positioning of NMR samples in racks/ boxes to match cow with results.



Additional milk sample testing offered to recording farmers

- Johnes disease (Herdwise/ Herd Tracker)
- Bovine Viral Diarrhoea (BVD)
- Leptospirosis
- Infectious Bovine Rhinotracheitis (IBR)
- Pregnancy diagnosis imminent



NMR sample identification

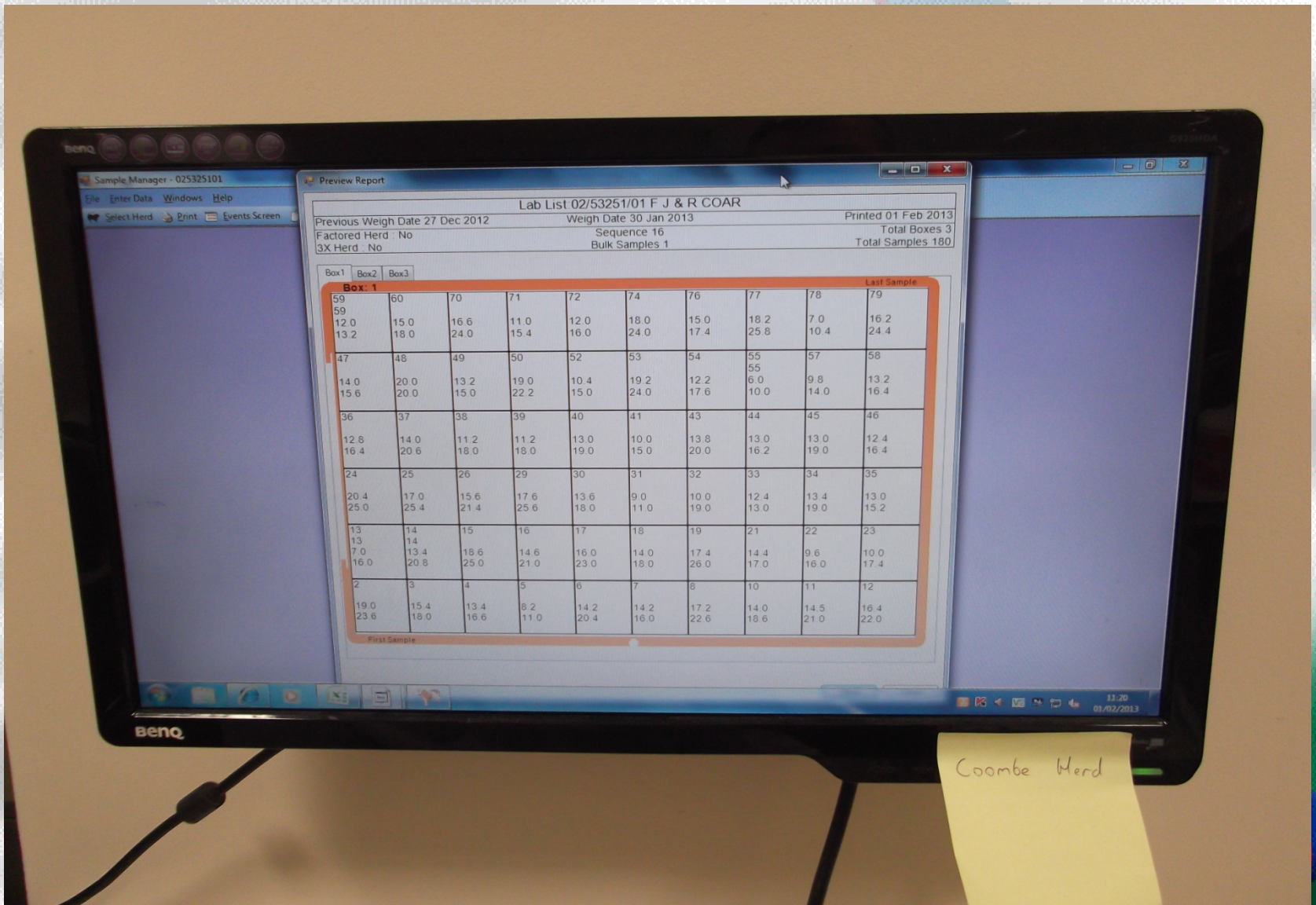


Cow numbers onto sample vials



[illegible]

Sample Manager system



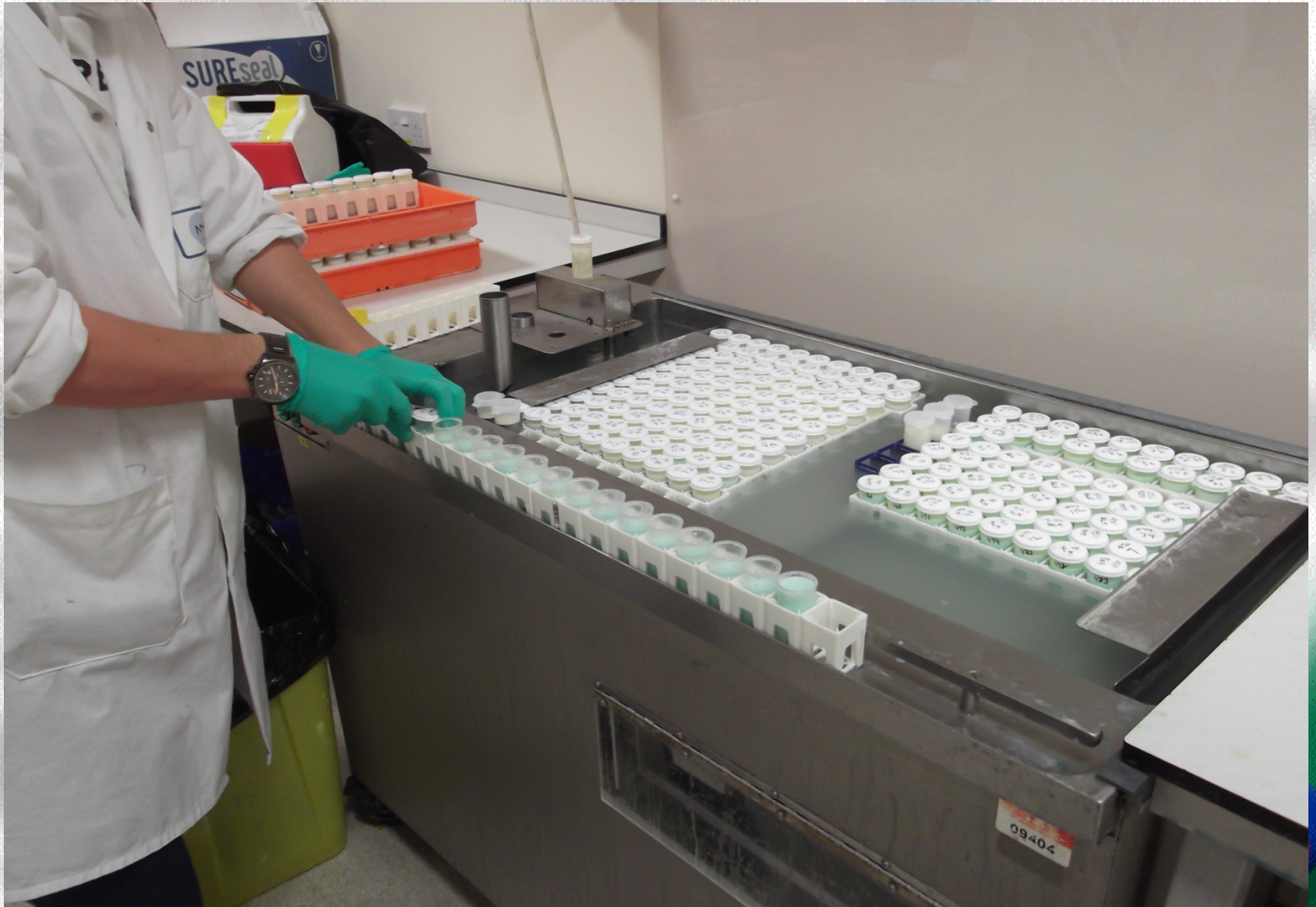
Checking sample position



Samples marked for additional testing



Lids and identities removed

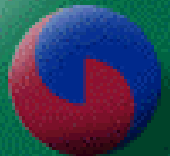


Cows identified by rack position



Why don't we use a hinged vial?

- Looked into trying to clean the permanent marker off a hinged lid- difficult.
- We could dispose of vials.
- It is more economical and environmentally friendly to wash and reuse vials.



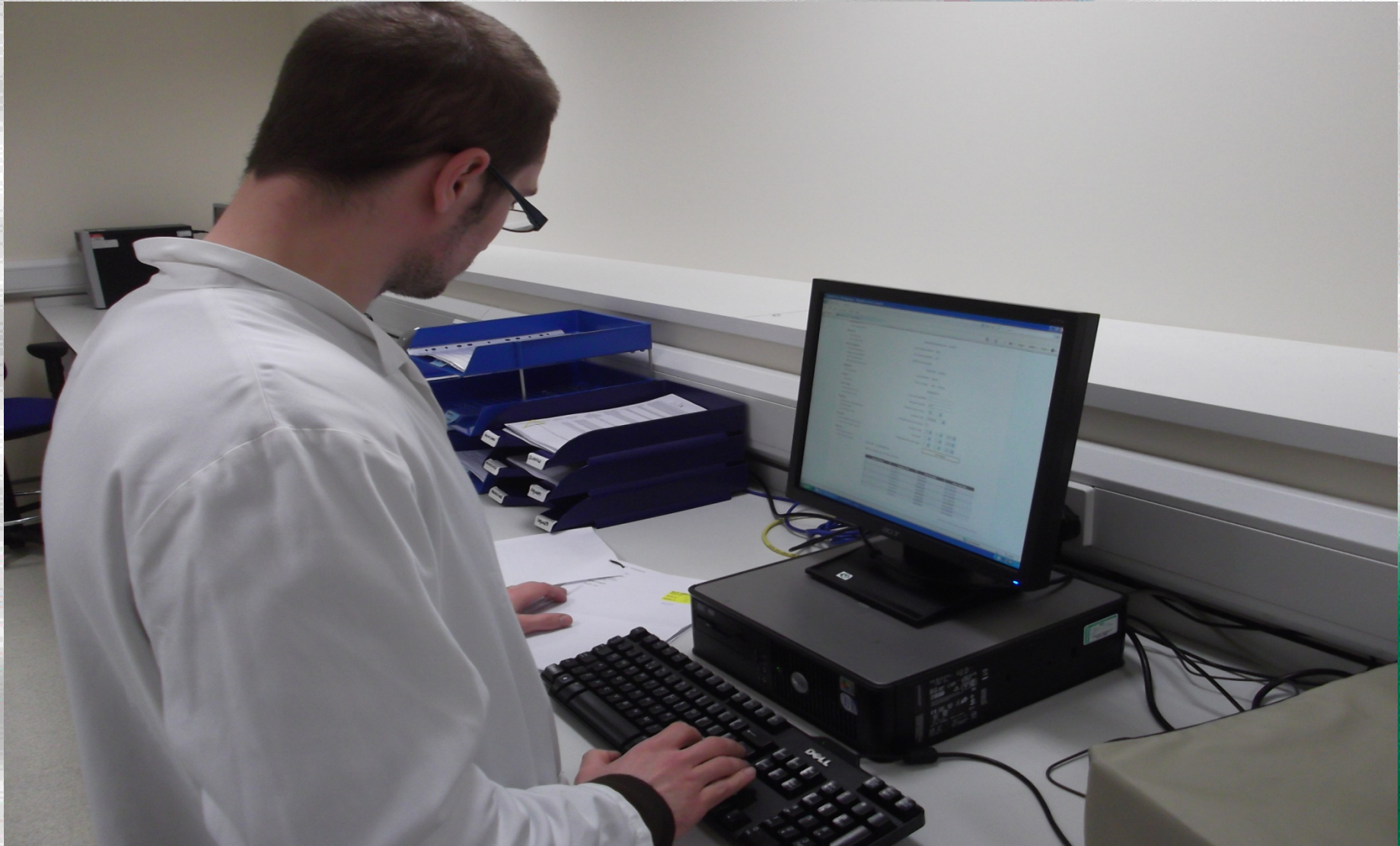
Boxes, racks and vials washed and reused



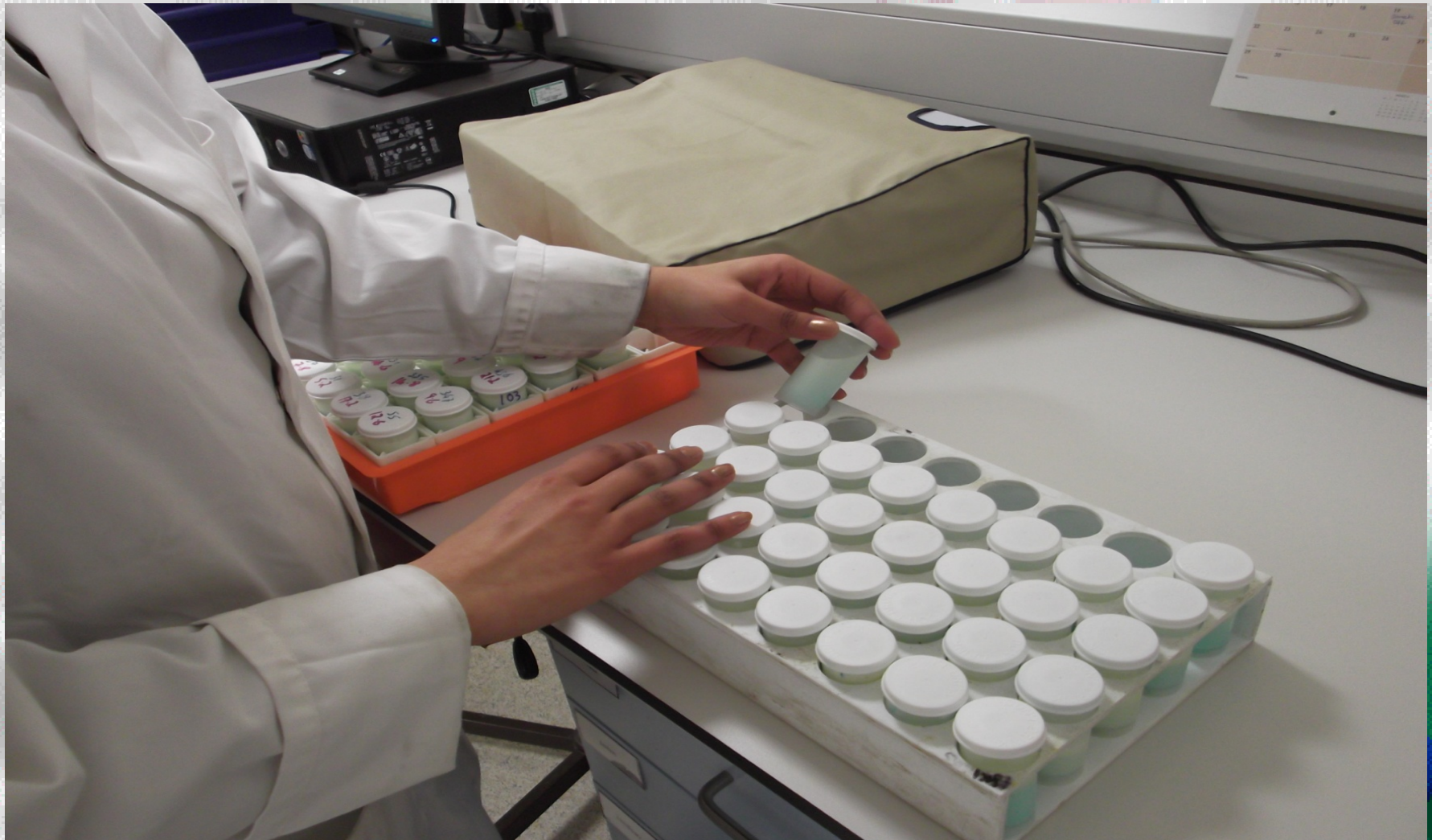
Preservative liquid added to pots
and new lids attached



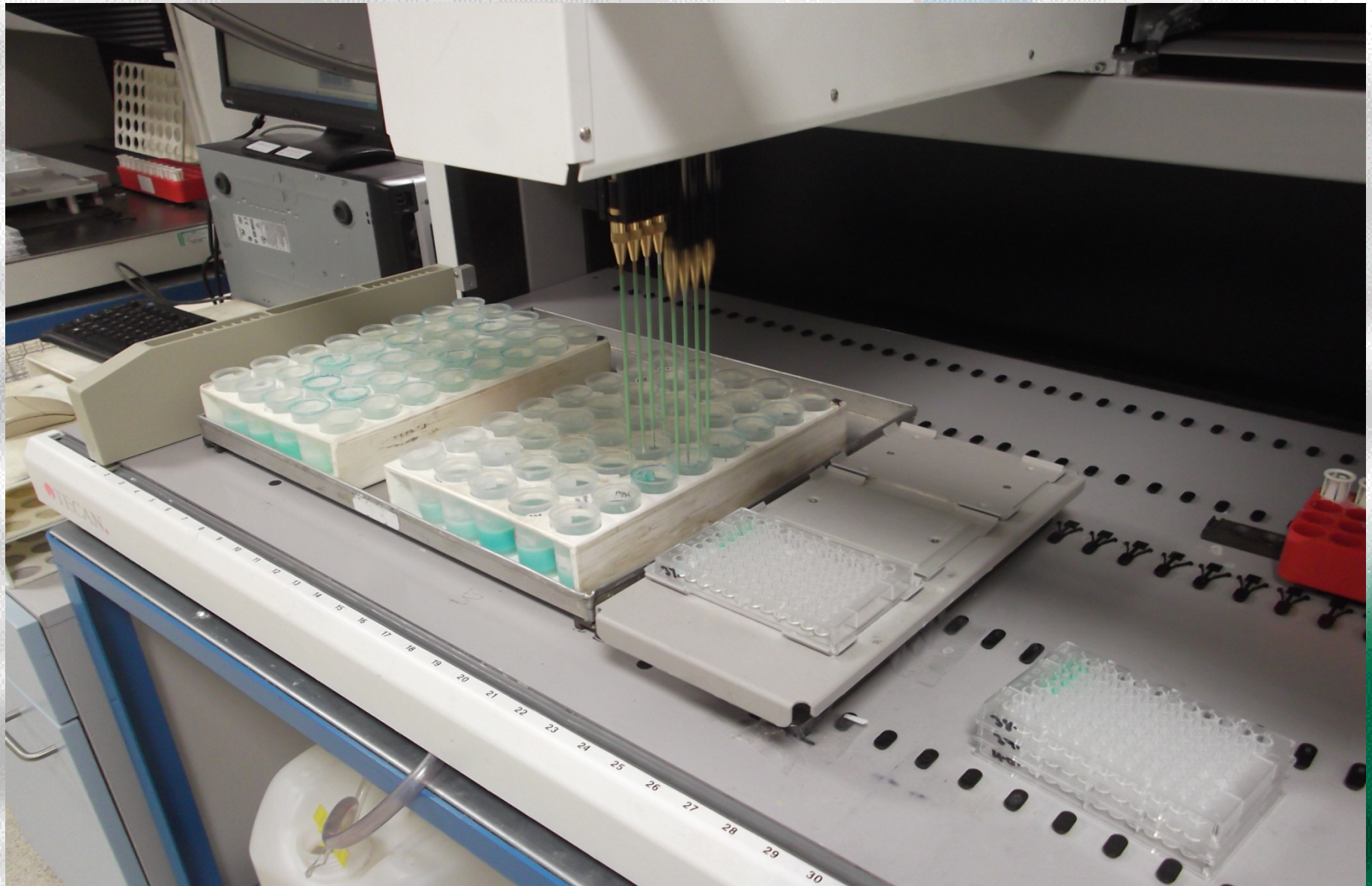
Manual entry into Hamsta



Rack out into white racks that fit
the Tecan Robot sampler



Samples into ELIZA wells on Tecan robot





Customer: HARTPURY COLLEGE

Address: Hartpury College
Hartpury House
Hartpury
Gloucestershire
GL19 3BE

Phone: 01452 700016

Email: peter.lord@hartpury.ac.uk

Total Pages: 2

Report Date: 22/04/2013

NMR Herd No.: 05/67627/02

Batch No.: 06060701

Certificate No.: 060607012013422154118

Location: Wolverhampton

Authorised by: Nicola Mason, Deputy
Laboratory Manager

NML HEALTHCHECK RESULTS (INDIVIDUAL COW SAMPLES)

Table 1: Results For The Detection Of Mycobacterium Avium Paratuberculosis (Johne's) in Individual Cow Milk.

Analysis methodology: Indirect ELISA using commercial test kit.

SAMPLE ID	SAMPLE DATE	MAP †	
		% S/P	Category
64	23/05/2007	5.02	Negative
372	23/05/2007	16.44	Negative
507	23/05/2007	1.87	Negative
581	23/05/2007	2.36	Negative
591	23/05/2007	2.66	Negative
1342	23/05/2007	11.32	Negative
1431	23/05/2007	3.74	Negative
1667	23/05/2007	7.28	Negative
1742	23/05/2007	36.71	Negative
1746	23/05/2007	6.69	Negative
1795	23/05/2007	10.63	Negative
1841	23/05/2007	6.69	Negative
1880	23/05/2007	19.98	Negative
1884	23/05/2007	8.27	Negative
1939	23/05/2007	3.74	Negative
1945	23/05/2007	5.71	Negative
2059	23/05/2007	5.02	Negative



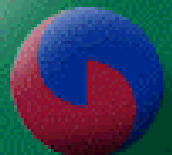
2700

Comments:

† Indicates the tests are within the NML scope of UKAS accreditation.

* These results indicate the disease status of 'Milk' samples tested at the laboratory & taken on the date specified above

We recommend that you analyse the results below in consultation with your veterinary surgeon, to whom a copy of this letter has been sent.



An improved method required

- We needed to improve the sample identification, increase the confidence that the right sample analysis was going to the right cow, reduce the manual keying errors and link the systems to reduce the staffing requirement.



Labels for disease/ PD samples



Bar code enabled



QR code enabled



Our vision/ reality

- Application of labels to sample pots
 - More robust method of identifying the sample after the pot lid has been removed.
 - Removes the requirement to write cow identities on every sample vial
 - Reminder to the lab technician that additional tests are required on that sample

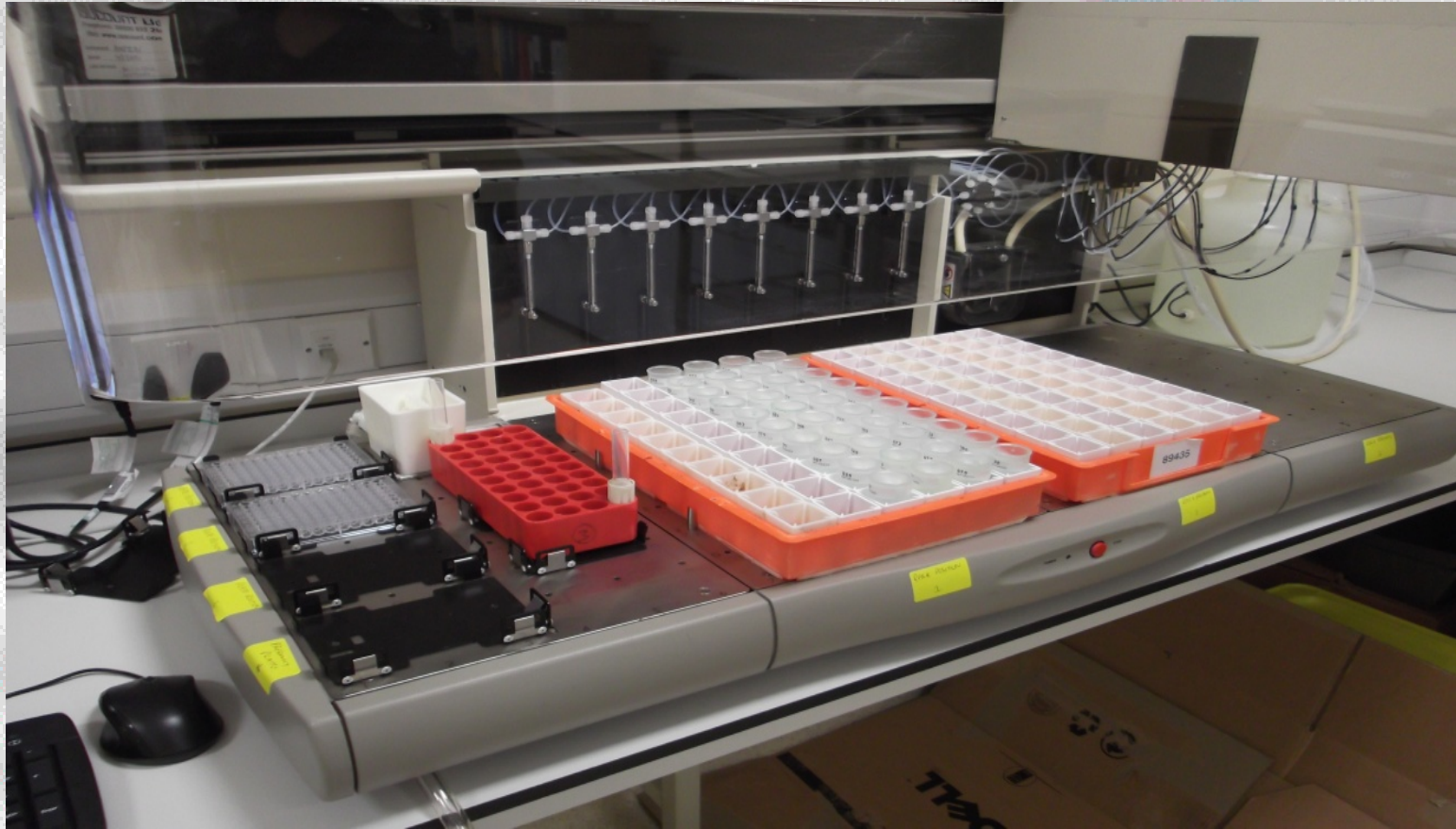


Automatic population of HAMSTA

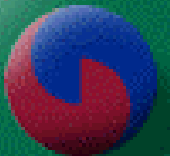
- Reduces keying errors
- Reduces staffing requirement to manually enter animal identities



NMR Boxes direct to robot



- Removes the requirement to rack out samples from NMR boxes into separate racks.



Conclusions

- Reduction in discarded samples in error by the combi operators
- Improved sample identification- an additional marker on the pot to confirm cow identity meaning the correct cow gets the correct analysis.
- Reduced keying errors by automatic population of the HAMSTA system.
- Reduced staffing requirement to manually key cow identities into HAMSTA.
- Use of the NMR box on the sampling robot means no need to rack out samples into different racks
- Set up to introduce automation using bar coded labels in the future



- Video of capper machine at the end of the presentation.

